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THE PLANT DISEASE REPORTER

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U. S. DEPARTMENT OF AGRICULTURE

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THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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CHECK LIST REVISION [1]

Freeman Weiss

AEGILOPS (GRAMINEAE)

AEGILOPS SPP., GOATGRASS. Weed grasses, especially A. CYLINDRICA Host, JOINTED G., introduced from Europe, occurring chiefly in the southern Great Plains and Pacific Coast States.

Cercosporella herpotrichoides Fron, cercosporella foot rot. Oreg.
Fusarium sp., head mold. Mich.
Puccinia glumarum (Schm.) Eriks. & Henn. (II,III), stripe rust. Wash. O & I unknown.
P. graminis Pers. (II,III), stem rust. Mich., Minn., O & I on Berberis spp., chiefly B. vulgaris L.
P. rubigo-vera (DC.) Wint. (II, III), leaf rust. Kans., Mich., Oreg., Wash. The var. tritici (Eriks. & Henn.) Carl. has been identified in Kans. & Oreg.; O & I formed on Thalictrum spp. but no field collections known.
Pythium arrhenomanes Drechsl., root browning (resistant). N. Dak.

AGROPYRON (GRAMINEAE)

AGROPYRON CRISTATUM (L.) Gaertn., CRESTED WHEATGRASS (1)*, A. DESERTORUM (Fisch.) Schult. (2), and A. SIBIRICUM L., SIBERIAN W. (3). Forage grasses of Eurasia; the first widely introduced, the others occasionally, in the Western States.

Ascochyta agropyrina (Fairm.) Trott., leaf spot. Mont., N. Dak., Wash.; Mich. (3).
Bacterium agropyri (O'Gara) Stapp, bacterial slime-spot. N. Dak.
Cercosporella herpotrichoides Fron, cercosporella foot rot. Wash.

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[1] The present section of the Revised Check List, and those to follow until further notice, will be restricted to host plants belonging to the Gramineae, including cereals, pasture and range grasses, and other economic members of the family.

* In this and subsequent sections of this list, it is to be understood that the record pertains to only the first named (principal) host if the state names indicating distribution are not followed by a numeral; it pertains to the other host spp. enumerated if the state names are followed by their respective numbers, and it pertains to both the principal and other hosts if the numbers are preceded by plus sign (+).

AGROPYRON CRISTATUM cont.

Claviceps purpurea (Fr.) Tul., ergot. Ind., S. Dak., Oreg., Wash.; Mich., Mont., N. Dak. (+3).
Colletotrichum graminicolum (Ces.) G. W. Wils., anthracnose. Minn. (2).
Curvularia geniculata (Tr. & Earle) Boed., secondary root rot. N. Dak. (3).
Erysiphe graminis DC., powdery mildew. Wash. (+3).
Fusarium culmorum (W. G. Sm.) Sacc., root rot. Oreg., Wash.
F. graminearum Schwabe, root rot. N. Dak. Conidial stage of Gibberella zeae (Schw.) Petch (G. saubinetii of authors, not (Mont.) Sacc.)
F. scirpi var. acuminatum (Ell. & Ev.) Wr., secondary root rot. Mont., S. Dak., Oreg., Wash.; Nebr., N. Dak. (+3).
Helminthosporium sativum Pam., King & Bakke, root rot. Md., Minn., Mont., Nebr., S. Dak.; N. Dak. (+3).
H. ? tritici-repentis Died., secondary root rot. S. Dak.
Mycosphaerella tassiana (de Not.) Johans., on stems. Oreg.
Phyllachora graminis (Pers. ex Fr.) Fckl., tar spot. Mich.
Phytophthora sp., leaf rot. N. Dak. (3).
Puccinia coronata Cda. (II, III), crown rust. Mich. (3).
P. glumarum (Schm.) Eriks. & Henn. (II, III), stripe rust. Calif., Idaho, Oreg.; Wash. (+ 2 & 3).
P. graminis Pers. (II, III), stem rust. Mich. (3), N. Dak., Wash. (+2 & 3). All records of stem rust of Agropyron spp. whether natural infection or resulting from artificial inoculation, so far as they have been confirmed, pertain to the vars. P. graminis secalis Eriks. & Henn. and P. g. tritici Eriks. & Henn.
P. montanensis Ell. (II, III), brown stripe rust. N. Dak. (+3). O & I on Berberis fendleri Gray.
P. rubigo-vera (DC.) Wint. (II, III), leaf rust. Mich., N. Dak. (+2 & 3).
Pythium arrhenomanes Drechsl., root browning. N. Dak. (+ 2 & 3), S. Dak.
P. debaryanum Hesse, P. irregulare Buism., and P. ultimum Trow, root necrosis. N. Dak. (+ 2 & 3).
P. graminicolum Subr. (P. arrhenomanes Drechsl. ?), seedling blight. S. Dak.
Rhizoctonia solani Kühn, secondary root rot. N. Dak. (+3), S. Dak.
Tilletia caries (DC.) Tul. and T. foetida (Wallr.) Liro, bunt. Wash.
Typhula idahoensis Remsburg, snow mold. Idaho.
Ustilago bullata Berk., head smut. Wash.
U. hordei (Pers.) Kell. & Swingle, covered smut. Mont., N. Dak., Wash.
U. hypodytes (Schl.) Fr., stem smut. Oreg.; Wash. (+3).
U. tritici (Pers.) Rostr., loose smut. Wash. (3).

AGROPYRON CRISTATUM cont.
Wojnowicia graminis (McAlp.) Sacc. & D. Sacc., secondary root rot. N. Dak., Oreg., Wash.

Bends (leaf deformity), cause unknown. Mont.; Wash. (+3).

AGROPYRON DASYSTACHYUM (Hook.) Scribn., THICKSPIKE WHEATGRASS (1); also A. ALBICANS Scribn. & Smith (2) and A. RIPARIUM Scribn. & Smith (3), native grasses of the Western and N. Central States.

Cercosporella herpotrichoides Fron, cercosporella foot rot. Wash. (3).
Claviceps purpurea (DC.) Tul., ergot. Mont., N. Dak., Wyo.; Wash. (+3).
Erysiphe graminis DC., powdery mildew. Oreg.
Fusarium scirpi var. acuminatum (Ell. & Ev.) Wr., secondary root rot. N. Dak. (3).
Helminthosporium sativum Pam., King & Bakke, root rot. N. Dak.
Pseudomonas coronafaciens var. atropurpurea (Reddy & Godkin) Stapp, chocolate spot. N. Dak.
Puccinia glumarum (Schm.) Eriks. & Henn. (II, III), stripe rust. Idaho, Wash. (+2 & 3).
P. graminis Pers. (II, III), stem rust. Calif., Mont., N. Dak. (+3), Oreg., Wash. (+2 & 3). The var. tritici Eriks. & Henn. has been confirmed.
P. montanensis Ell. (II, III), brown stripe rust. Idaho (3), Mont., N. Dak. (3), Wash.
P. rubigo-vera (DC.) Wint. (II, III), leaf rust. Colo., N. Dak. (+3), Oreg., Wash. (+2 & 3). The vars. agropyri (Eriks.) Arth. and agropyrina (Eriks.) Arth. have been identified on this host; C & I on Ranunculaceae.
Pythium arrhenomanes Drechsl., root browning. N. Dak. (+3).
P. debaryanum Hesse, root necrosis. N. Dak. (3).
Rhynchosporium secalis (Oud.) Davis, scald. Oreg.
Sclerotium sp., secondary root rot. N. Dak.
Scolecotrichum graminis Fckl., leaf streak. N. Dak. (3), Oreg., Wyo.
Selenophoma donacis (Pass.) Sprague & A. G. Johns. var., stem speckle. N. Dak. (+2), Oreg.
Ustilago bullata Berk., head smut. Wash.
U. hypodytes (Schl.) Fr., stem smut. Wash. (+3).
Wojnowicia graminis (McAlp.) Sacc. & D. Sacc., secondary root rot. Wash. (3).

Bends, cause unknown. Wash.

AGROPYRON REPENS L., QUACKGRASS. Weed of Eurasia, occurring throughout the U. S. except the South.

Ascochyta graminicola Sacc., on leaves. Mass.

AGROPYRON REPENS cont.

Claviceps purpurea (Fr.) Tul., ergot. Widespread.
Colletotrichum graminicolum (Ces.) G. W. Wils., anthracnose. Minn., Pa., Tex.
Didymella agrostidis Dearn. & House, on stems. N. Y.
Ditylenchus dipsaci (Kühn) Filip., stem nematode. N. Y.
Erysiphe graminis DC., powdery mildew. Widespread.
Fusarium scirpi var. acuminatum (Ell. & Ev.) Wr., secondary root rot. Minn., N. & S. Dak.
Helminthosporium giganteum Heald & Wolf, zonate eyespot. Md., Tex., Va.
H. halodes Drechsl., secondary root rot & seed mold. Minn.
H. sativum Pam., King & Bakke, leaf spot, root rot. Minn., N. and S. Dak., Wis.
H. tritici-repentis Died., leaf blotch. Mich., N. Y., Oreg., Wis. Conidial stage of Pyrenophora tritici-repentis (Died.) Drechsl.
Marasmius tritici P. A. Young, collar rot. Ill., Minn.
Ophiobolus graminis Sacc., take-all. N. Y.
Ovularia pulchella (Ces.) Sacc., leaf spot. Wis.
Phyllachora graminis (Pers. ex Fr.) Fckl., tar spot. Maine to Iowa & Minn.
Pseudomonas coronafaciens var. atropurpurea (Reddy & Godkin) Stapp, chocolate spot. N. Y. to Nebr. & N. Dak.
Puccinia coronata Cda. (II, III), crown rust. Mass., N. H., Vt.
P. glumarum (Schm.) Eriks. & Henn. (II, III), stripe rust. Idaho, Mont., Wash.
P. graminis Pers. (II, III), stem rust. Maine to Ky., Nebr. & N. Dak.; Calif. The vars. secalis and tritici Eriks. & Henn. have been confirmed, the former predominating.
P. montanensis Ell., brown stripe rust (II, III). Mont., N. & S. Dak.
P. rubigo-vera (DC.) Wint. (II, III), leaf rust. Widespread. The var. agropyrina (Eriks.) Arth. is the commonest form on this host in the Eastern States.
Pythium arrhenomanes Drechsl., root browning. Minn., N. & S. Dak.
P. debaryanum Hesse, root necrosis. N. Dak.; P. periilum Drechsl. and P. ultimum Trow, Minn.
Rhizoctonia solani Kühn, secondary root rot. Minn., N. Dak.
Rhynchosporium secalis (Oud.) Davis, scald. Calif., Minn., N. Dak., Oreg., Wash., Wis.
Scolecotrichum graminis Fckl., leaf streak. N. Dak., Wash.
Selenophoma donacis (Pass.) Sprague & A. G. Johns. var., stem speckle. Wash.
Septoria infuscans (Ell. & Ev.) Sprague, leaf spot. S. Dak.
S. elymi Ell. & Ev., leaf mottle. Widespread.
S. nodorum Berk., leaf spot. Oreg.
Stagonospora arenaria Sacc., leaf blotch. Oreg.
Tilletia earlei Griff., stem smut. N. Dak.
Urocystis agropyri (Preuss.) Schroet., flag smut. New England to Pa.; Mo., Wis.

AGROPYRON REPENS cont.

Ustilago hypodytes (Schl.) Fr., stem smut. Idaho, Mich., N. Y., N. & S. Dak., Oreg., Wash.

U. macrospora Desm., stripe smut. Iowa, Mass., Minn., Wis.

U. striaeformis (Westend.) Niessl, stripe smut. N. Y., Pa., Tex.

Wojnowicia graminis (McAlp.) Sacc. & D. Sacc., secondary root rot. N. Dak.

Xanthomonas translucens (L. R. Jones, A. G. Johns. & Reddy) Dowson, bacterial blight. Calif., Oreg.

Bends, cause unknown. Wis.

AGROPYRON SMITHII Rydb., WESTERN WHEATGRASS (BLUESTEM W.). Valuable range plant of the Western States and introduced in the East; sometimes grown for hay and for erosion control.

Ascochyta agropyrina (Fairm.) Trott., leaf rot. Mont.

Bacterium agropyri (O'Gara) Stapp, bacterial slime spot. Mont., Utah.

Cladosporium herbarum Lk., leaf-speckle. N. Dak. Conidial stage of Mycosphaerella tulasnei Jacz.

Claviceps purpurea (Fr.) Tul., ergot. Widespread.

Epichloë typhina (Pers. ex Fr.) Tul., cat-tail, choke. N. Dak.

Erysiphe graminis DC., powdery mildew. Mont., Nebr., N. & S. Dak.

Fusarium culmorum (W. G. Sm.) Sacc., head mold. Minn.

F. scirpi var. acuminatum (Ell. & Ev.) Wr., secondary root rot. Minn., Mont., Nebr., N. & S. Dak., Wyo.

F. sporotrichioides Sherb. S. Dak.

Helminthosporium sativum Pam., King & Bakke, root rot. Minn., Mont., Nebr., N. & S. Dak., Wyo.

H. tritici-repentis Died., leaf blotch. Minn., Mont., N. Y., S. Dak., Wyo.

Phyllachora graminis (Pers. ex Fr.) Fckl., tar spot. Nebr., N. Y.

Pseudomonas coronafaciens var. atropurpurea (Reddy & Godkin) Stapp, chocolate spot. Mont., N. & S. Dak., Wyo.

Puccinia glumarum (Schm.) Eriks. & Henn. (II, III), stripe rust. Colo., Mont., Wash.

P. graminis Pers. (II, III), stem rust. Widespread. The vars. secalis and tritici Eriks. & Henn. have been confirmed.

P. montanensis Ell., brown stripe rust (II, III). Colo., Mont., Nebr., N. & S. Dak., Wash.

P. rubigo-vera (DC.) Wint. (II, III), leaf rust. Widespread. The vars. agropyri (Eriks.) Arth. and agropyrina (Eriks.) Arth. (O and I on Ranunculaceae), and apocrypta (Ell. & Tr.) Arth. (O & I on Hydrophyllaceae), have been identified.

Pythium arrhenomanes Drechsl., root browning. N. Dak.

P. debaryanum Hesse, root necrosis. N. & S. Dak., Wyo.

P. ultimum Trow., root necrosis. N. Dak.

AGROPYRON SMITHII cont.
Rhizoctonia solani Kühn, secondary root rot. N. & S. Dak., Wyo.
Scolecotrichum graminis Fckl., leaf streak. N. Dak., Oreg.
Selenophoma donacis (Pass.) Sprague & A. G. Johns. var., stem speckle. N. & S. Dak., Wyo.
Septoria infuscans (Ell. & Ev.) Sprague, leaf spot. Mont., N. & S. Dak.
S. elymi Ell. & Ev., leaf mottle. N. & S. Dak.
S. nodorum Berk., glume blotch. Mich.
Stagonospora arenaria Sacc., leaf blotch. N. Dak.
Tilletia earlei Griff., stem smut. S. Dak.
Urocystis agropyri (Preuss.) Schroet., flag smut. N. Mex., N. & S. Dak., Utah.
Ustilago hypodytes (Schl.) Fr., stem smut. Colo., Mont., N. & S. Dak., Oreg., Wash.
Wojonowicia graminis (McAlp.) Sacc. & D. Sacc., secondary root rot. Kans., Mont.

AGROPYRON SPICATUM (Pursh) Scribn. & Smith, BLUEBUNCH WHEATGRASS (1) and A. INERME (Scribn. & Smith) Rydb., BEARDLESS W. (2). Valuable range grasses of the Western States, the latter chiefly in the Northwest.

Cercosporella herpotrichoides Fron, foot rot. Wash. (2).
Claviceps purpurea (Fr.) Tul., ergot. Mont. (2), Oreg., Wash.
Dilophospora alopecuri Fr., twist. Wash. (2).
Epichloë typhina (Pers. ex Fr.) Tul., cat-tail, choke. Wash.
Erysiphe graminis DC., powdery mildew. Oreg., Wash. (+2).
Helminthosporium sp., leaf spot. Mich.
H. sativum Pam., King & Bakke, root rot. N. Dak.
Mycosphaerella tulasnei Jacz. (Cladosporium herbarum Lk.), leaf mold. Oreg., Wash.
Puccinia glumarum (Schm.) Eriks. & Henn. (II, III), stripe rust. Colo.; Mont., Oreg. & Wash. (+2).
P. graminis Pers. (II, III), stem rust. Mich., N. Dak. & Wash. (+2). The var. tritici Eriks. & Henn. has been confirmed on (2).
P. montanensis Ell. (II, III), brown stripe rust. Colo., Mich. (+2), Mont., Oreg., Wash.
P. pattersoniana Arth. (II, III), Patterson's rust. Mont., Oreg., Utah, Wash. O & I on Brodiaea douglasii Wats.
P. rubigo-vera (DC.) Wint. (II, III), leaf rust. Widespread. Chiefly the var. agropyri (Eriks.) Arth.
Pythium arrhenomanes Drechsl., root browning. N. Dak.
Scolecotrichum graminis Fckl., leaf streak. Mont., Oreg. (+2).
Selenophoma sp., stem spot. Wash. (2).
S. donacis (Pass.) Sprague & A. G. Johns. var., stem speckle. N. Dak., Wash. (+2), Wyo.
Septogloeum oxysporum Sacc., Bomm. & Rouss., char spot. Wyo.
Septoria elymi Ell. & Ev., leaf mottle. Oreg. (+2), Wash., Wyo.

AGROPYRON SPICATUM cont.

Septoria infuscans (Ell. & Ev.) Sprague, brown blotch. Oreg.
S. nodorum Berk., glume blotch. N. Dak.
Urocystis agropyri (Preuss.) Schroet., flag smut. Oreg., Utah, Wash.
Ustilago bullata Berk., head smut. Utah, Wash. (+2).
U. hypodytes (Schl.) Fr., stem smut. Wash. (+2).
U. macrospora Desm., stripe smut. Oreg.; Utah & Wash. (+2).
U. striaeformis (Westend.) Niessl, stripe smut. Wash. (+2).
Wojnowicia graminis (McAlp.) Sacc. & D. Sacc., secondary root rot. Wash. (2).

Bends, cause unknown. Wash. (+2).

AGROPYRON SUBSECUNDUM (Link) Hitchc. (A. CANINUM of American authors, not (L.) Beauv.), BEARDED WHEATGRASS. Valuable forage grass occurring throughout the Western and Central States to New England.

Ascochyta agropyrina (Fairm.) Trott., leaf rot. N. Dak.
Claviceps purpurea (Fr.) Tul., ergot. Iowa, Mich., Minn., Utah, Wash.
Erysiphe graminis DC., powdery mildew. Minn., Wyo.
Fusarium graminearum Schwabe, and F. scirpi var. acuminatum (Ell. & Ev.) Wr., secondary root rot. N. Dak.
Helminthosporium sp., leaf spot. Minn.
H. sativum Pam., King & Bakke, root rot. N. Dak.
Leptosphaeria culmifraga (Fr.) Ces. & de Not., on stems. Calif.
L. culmorum Auers. N. Dak.
Pseudomonas coronafaciens var. atropurpurea (Reddy & Godkin) Stapp, chocolate spot. N. Dak.
Puccinia glumarum (Schm.) Eriks., stripe rust. Mont., Wash., Wyo.
P. graminis Pers., ~~stem rust. Widespread. The vars.~~ secalis and tritici Eriks. & Henn. have been confirmed.
P. montanensis Ell., brown stripe rust. Colo., Mich., Mont., Oreg.
P. rubigo-vera (DC.) Wint., leaf rust. Widespread. (The vars. agropyri and agropyrina, and several f. sp. have been identified on this host.)
Sclerotium rhizodes Auers., on leaves. Wis.
Scolecotrichum graminis Fckl., leaf streak. Colo.
Selenophoma donacis (Pass.) Sprague & A. G. Johns. var., stem speckle. Mont.
Septoria elymi Ell. & Ev., leaf mottle. Minn., Mont.
Ustilago bullata Berk., head smut. Wash., Wyo.

Bends, cause unknown. Wash.

AGROPYRON TRACHYCAULUM (Link) Malte (A. PAUCIFLORUM (Schwein.) Hitchc.), SLENDER WHEATGRASS. Native grass occurring throughout the northern U. S., important range grass in the West and widely grown for hay and pasture.

Ascochyta agropyrina (Fairm.) Trott., leaf rot. N. Dak.
Claviceps purpurea (Fr.) Tul., ergot. Widespread.
Colletotrichum graminicolum (Ces.) G. W. Wils., anthracnose. N. Dak.
Dilophospora alopecuri Fr., twist. N. Dak., Wyo.
Epichloë typhina (Pers. ex Fr.) Tul., cat-tail, choke. Mont., N. Dak., Wash.
Erysiphe graminis DC., powdery mildew. N. Central States to Pacific Northwest.
Fusarium spp., secondary root rot. Spp. thus associated include F. equiseti (Cda.) Sacc., N. Dak.; F. oxysporum Schl. emend. Snyder & Hansen, N. Dak.; F. scirpi var. acuminatum (Ell. & Ev.) Wr. and var. longipes (Wr. & Reink.) Wr., N. Dak.; F. sporotrichioides Sherb. Mont., N. and S. Dak., Wyo.
Helminthosporium sativum Pam., King & Bakke, root rot. N. & S. Dak.
Leptosphaeria culmifraga (Fr.) Ces. & de Not., on stems. N. Dak.
Ovularia pulchella (Ces.) Sacc. var. agropyri Davis, leaf spot. Wis.
Physalospora festucae (Lib.) Sacc., on leaves. N. Dak.
Pseudomonas coronafaciens var. atropurpurea (Reddy & Godkin) Stapp, chocolate spot. N. & S. Dak.
Puccinia glumarum (Schm.) Eriks. & Henn. (II,III), stripe rust. Idaho, Mont., Wash., Wyo.
P. graminis Pers. (II, III), stem rust. Widespread. The vars. secalis and tritici Eriks. & Henn. have been confirmed.
P. montanensis Ell. (II, III), brown stripe rust. Mich. to N. Mex., N. Dak. & Wash.
P. rubigo-vera (DC.) Wint. (II, III), leaf rust. Widespread. The vars. agropyri (Eriks.) Arth., agropyrina (Eriks.) Arth., and apocrypta (Ell. & Tr.) Arth. have been identified.
Pythium aristosporum Vanterpool and P. arrhenomanes Drechsl., root browning. N. Dak.
P. debaryanum Hesse, root necrosis. N. Dak., Wash.
Rhizoctonia solani Kühn, secondary root rot. N. Dak.
Rhynchosporium secalis (Oud.) Davis, scald. Wash.
Scolecotrichum graminis Fckl., leaf streak. Minn. to Nev. & Wash.
Selenophoma donacis (Pass.) Sprague & A. G. Johns. var., stem speckle. Mont.
Septogloeum oxysporum Sacc., Bomm. & Rous., char spot. N. & S. Dak.
Septoria infuscans (Ell. & Ev.) Sprague, leaf spot. Mont., N. Dak.
S. elymi Ell. & Ev., leaf mottle. N. Dak., Oreg.
S. nodorum Berk., glume blotch. N. Dak.
Stagonospora arenaria Sacc., purple leaf blotch. Mich., N. Dak.

AGROPYRON TRACHYCAULUM cont.

Urocystis agropyri (Preuss.) Schroet., flag smut. Utah, Wyo.
Ustilago bullata Berk., head smut. Idaho, Mich., Mont., Oreg., Utah, Wash.
U. hypodytes (Schl.) Fr., stem smut. Wash.
U. striaeformis (Westend.) Niessl, stripe smut. Mont., Oreg., S. Dak., Utah, Wash.

Bends, cause unknown. Mont., Wash.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

MARYLAND FIELD CORN LEAF BLIGHT DISEASE SURVEY - 1942

E. A. Walker and J. W. Magruder

A severe epiphytotic of leaf blight developed on field corn in Maryland during the latter part of the 1942 growing season. Corn yields were reduced and the feeding value of the stover was greatly impaired by 2 diseases; bacterial leaf blight caused by Phytomonas [Bacterium] stewartii, and Helminthosporium leaf blight caused by Helminthosporium turcicum.

Bacterial leaf blight appeared by July 4 and became very destructive in some early planted corn fields by the first of August. Corn hybrids and open-pollinated field corn varieties were both affected by this disease. Bacterial leaf blight has seldom been reported as causing damage to field corn in Maryland. The blighted leaves soon dried up as if they were scorched by fire; the stalks were weakened by Diplodia and Gibberella stalk rots, which spread to shanks, causing the ears to bend over and hang down. Corn for silage was cut 10 to 14 days earlier than usual. Much of it was too dry at that time for making the best ensilage. Observations of ears from this damaged corn showed many shriveled and light weight kernels that were loosely attached to a spongy cob.

Following closely behind, and sometimes along with the bacterial leaf blight, was the Helminthosporium leaf blight which developed rapidly during the humid cloudy days after the middle of August. The leaves became spotted, then brownish streaks appeared. They soon dried up making the field of corn appear as if frost had killed the leaves. After the corn was cut and shocked, the blighted leaves deteriorated to such an extent that considerable stover was lost in the field while husking the corn, and much of the feed value was lost in that which remained. Although Helminthosporium leaf blight was worse in 1942 on both field corn and sweet corn than ever before reported for the State, the yield was not materially reduced since much of the corn was mature before the disease killed the leaves.

The presence of both the bacterial and Helminthosporium leaf blights in field corn in 1942 brought about an increased amount of Diplodia dry ear rot (Diplodia zeae) and Fusarium pink ear rot (Gibberella zeae). Diplodia was about 8 times more abundant than the Fusarium type of ear rot.

Corn farmers became alarmed about the condition of their corn prior to harvest time and desired information on the nature, cause and distribution of the disease. Many growers were trying out hybrid corn which was new to their community. Some were reaching the conclusion that the leaf blight disease was worse on hybrid corn than on the open-pollinated varieties which they were accustomed to growing.

In order to learn more about the prevalence of and damage from the corn leaf blight diseases, a survey conducted cooperatively by the University of Maryland Plant Pathology and Agronomy Departments was begun on August 27 and completed by September 9. In 12 representative corn-producing counties, farms were selected at random, and some University of Maryland Extension Service Hybrid Demonstration plots were also visited. A history of each field, its fertility and productivity, was recorded on a standard survey form. In each field one or more rows of corn were selected at random and 100 or more consecutive corn plants were examined for the degree of corn leaf blight injury. No effort was made to distinguish between the bacterial and the Helminthosporium leaf blight lesions, since the 2 diseases were often present on the same leaf and in the same lesion. In some cases the leaf was dead and the cause could not definitely be ascertained. Uniformity in rating the degree of leaf blight injury was maintained as far as possible. When 2 persons were taking records in the same field, they would meet after making observations on 500 plants and check with each other to maintain a uniform system of rating the diseased plants.

This field corn leaf blight survey covered 12 counties in Maryland, and represented 231 acres of hybrid and 144 acres of open-pollinated corn. Twenty-five farms or demonstration plots were visited, and 24500 hybrid and 4800 open-pollinated plants of corn were examined. Observations for each county visited are summarized in Table 1. The amount and degree of leaf blight on hybrid corn is shown in Tables 2 and 3, and on open-pollinated varieties in Tables 4 and 5. Table 6 shows the results of observations made by Dr. R. G. Rothgeb and Dr. A. D. Hoadley of the Agronomy Department, University of Maryland, on 5 Experiment Station corn test plots located in different sections of the State.

The following range was used to express the degree of leaf blight infection for each corn plant examined:

None - 0-20% of leaf area affected (several basal leaves were infected or dead).

Slight - 21-40% of leaf area affected (lower leaves were dead and leaf spots appeared on leaves about half way up the stalk).

Moderate - 41-60% of leaf area affected (leaves about half way up the stalk were dead or severely affected with scattered new lesions developing on leaves above).

Severe - 61-80% of leaf area affected (all leaves severely spotted, with leaves dead from the bottom upward and approaching the top).

Dead - 81-100% of leaf area affected (all leaves dead or severely spotted and plants dead or nearly so).

Table 1. Leaf blight injury on hybrid and open-pollinated corn in Maryland counties, 1942 [a]

Corn type	Acres	Number plants examined	Leaf blight injury -- percentage of leaf area affected: Number of plants showing indicated injury					Percentage of plants showing indicated injury					Average leaf area blighted
			None: 0-20	Slight: 21-40	Moderate: 41-60	Severe: 61-80	Dead: 81-100	None: 0-20	Slight: 21-40	Moderate: 41-60	Severe: 61-80	Dead: 81-100	
Baltimore County													
Hybrid	3	1200	1	786	357	56	0	0.01	65.5	29.8	4.6	0.0	37.8
Open-pollinated	20 3/4	600	0	344	216	40	0	0.0	57.3	36.0	6.7	0.0	39.9
All corn:	23 3/4	1800	1	1130	573	96	0	0.0	62.8	31.8	5.4	0.0	38.5
Carroll County													
Hybrid	14	600	0	3	76	329	192	0.0	0.5	12.7	54.8	32.0	73.7
Cecil County													
Open-pollinated	7	200	1	178	20	2	0	0.5	89.0	10.0	0.5	0.0	32.5
Charles County													
Hybrid	3	2300	0	67	362	865	1006	0.0	2.9	15.7	37.7	43.7	74.4
Open-pollinated	1/2	400	0	55	138	121	86	0.0	13.8	34.5	30.2	21.5	61.9
All corn:	3 1/2	2700	0	122	500	986	1092	0.0	4.5	18.5	36.5	40.5	72.6

Dorchester County													
Hybrid	3 1/4	2600	0	2201	399	0	0	0.0	84.7	15.3	0.0	0.0	33.1
Open-pollinated	1/2	400	0	381	19	0	0	0.0	95.3	4.7	0.0	0.0	31.0
All corn:	3 3/4	3000	0	2582	418	0	0	0.0	86.1	13.9	0.0	0.0	32.8
Frederick County													
Hybrid	120	5100	11	928	1545	1586	1030	0.2	18.2	30.3	31.1	20.2	60.6
Open-pollinated	32	500	17	398	71	10	4	3.4	79.6	14.2	2.0	0.8	33.4
All corn:	142	5600	28	1326	1616	1596	1034	0.5	23.7	28.9	28.5	18.4	58.2
Harford County													
Hybrid	4 1/4	2800	0	2536	263	1	0	0.0	90.6	9.4	0.0	0.0	31.9
Open-pollinated	27 1/2	1000	0	870	116	14	0	0.0	87	11.6	1.4	0.0	32.9
All corn:	31 3/4	3800	0	3406	379	15	0	0.0	89.6	10.0	0.4	0.0	32.2
Kent County													
Hybrid	41	800	0	647	132	21	0	0.0	80.9	16.5	2.6	0.0	42.9
Open-pollinated	44	400	0	393	7	0	0	0.0	98.3	1.7	0.0	0.0	30.4
All corn:	85	1200	0	1040	139	21	0	0.0	86.7	11.6	1.7	0.0	33.0
Queen Annes County													
Open-pollinated	18	200	0	193	7	0	0	0.0	96.5	3.5	0.0	0.0	30.7

Table 1. Leaf blight injury on hybrid and open-pollinated corn in Maryland counties, 1942 [a] (continued).

Corn type	Acres	Number plants examined	Leaf blight injury -- percentage of leaf area affected: Number of plants showing indicated injury: None 0-20	Slight 21-40	Moderate 41-60	Severe 61-80	Dead 81-100	Percentage of plants showing indicated injury: None 0-20	Slight 21-40	Moderate 41-60	Severe 61-80	Dead 81-100	Average leaf area blighted
Somerset County records altered by nutritional disturbance													
Talbot County													
Hybrid	10	200	0	118	82	0	0	0.0	59.0	41.0	0.0	0.0	38.2
Washington County													
Hybrid	26	6000	43	4214	893	653	197	0.7	70.2	14.9	10.9	3.3	39.2
Open-pollinated	4	1000	19	866	59	35	21	1.9	86.6	5.9	3.5	2.1	33.5
All corn	30	7000	62	5080	952	688	218	0.9	72.6	13.6	9.8	3.1	38.3

[a] Bacterial wilt and Helminthosporium blight not separated

Table 2. Degree of Leaf Blight Injury on Hybrid Field Corn in Maryland

Hybrid Corn	Acres	Plants Examined	Number Plants affected				
			None	Slight	Moderate	Severe	Dead
			0-20	21-40	41-60	61-80	81-100[a]
Pioneer 300	11	1500	0	563	314	363	260
" 314	3 1/2	1100	0	752	73	120	155
" 317	1 1/4	300	0	158	49	32	61
" 319	2 1/4	300	0	164	51	64	21
" 324	1/4	200	0	161	39	0	0
" 332	20	1700	0	606	302	567	225
" 333	1/4	200	1	157	42	0	0
" 336	1 1/4	300	0	187	27	69	17
" 340	1/4	200	0	180	20	0	0
Funk G 46	1/4	100	0	100	0	0	0
" 63	1/2	400	0	350	50	0	0
" 94	19 1/2	1700	0	895	430	287	88
" 135	19 1/4	1400	19	1191	96	70	24
" 169	10	200	0	47	132	21	0
" 235	3	200	0	11	82	98	9
" 702	1/2	400	0	190	151	54	5
U. S. 13	46 3/4	3600	5	2247	521	418	409
" 44	10 3/4	500	0	204	112	159	25
" 88	4	200	0	63	102	30	5
" 98	1	300	0	144	17	18	121
" 442	5	200	0	44	126	26	4
De Kalb 639	6	200	0	0	0	28	172
" 680	1	200	0	0	23	73	104
" 800 A	1	200	0	0	19	77	104
" 816	12	300	0	117	153	27	3
" 817 A	3	200	0	1	17	139	43
" 825	1	200	0	9	61	78	52
" 827	6 1/2	600	0	427	125	34	14
" 835	1	200	0	2	37	96	65
" 840	8	400	0	120	113	100	67
" 899	1/4	200	0	150	50	0	0
Ky. Y 102	1 1/4	900	20	687	109	77	7
Indiana 608	4	600	0	186	170	177	67
Ohio C 88	1 1/2	1000	0	734	67	58	141
Iowa 939	9 1/2	1300	1	815	219	111	154
Iowealth TX-1	3	200	9	186	5	0	0
" A4	3	200	0	31	134	32	3
" 25	3 1/4	400	0	336	56	8	0
Aver. of 22 Misc. Hyb.[b]	5 1/2	2200	0	2185	15	0	0
Hybrids: Total	231 3/4	24500	55	14400	4109	3511	2425

[a] Range of leaf blight area in per cent.

[b] Hybrids grown in Somerset County, all showing slight leaf blight injury coupled with nutritional disturbance.

Table 3. Percentage of Leaf Blight Injury on Hybrid Field Corn in Maryland

Hybrid	Farms	Plants Examined	Degree of Leaf Blight Injury					Average Leaf Area Blighted
			None	Slight	Moderate	Severe	Dead	
Pioneer 300	9	1500	0	37.5	20.9	24.2	17.4	54.3
" 314	7	1100	0	68.4	6.6	10.9	14.1	44.1
" 317	2	300	0	52.7	16.3	10.7	20.3	49.7
" 319	2	300	0	54.7	17	21.3	7	46.1
" 324	1	200	0	80.5	19.5	0	0	33.9
" 332	10	1700	0	35.6	17.8	33.4	13.2	54.8
" 333	1	200	0.5	78.5	21	0	0	34.1
" 336	2	300	0	62.3	9	33	5.7	44.4
" 340	1	200	0	90	10	0	0	32.0
Funk G 46	1	100	0	100	0	0	0	20.0
" 63	1	400	0	87.5	12.5	0	0	32.5
" 94	10	1700	0	52.6	25.3	16.9	5.2	44.9
" 135	8	1400	1.4	85	6.9	5	1.7	35.5
" 169	1	200	0	23.5	66	10.5	0	47.4
" 235	1	200	0	5.5	41	49.0	4.5	60.5
" 702	1	400	0	47.5	37.8	13.5	1.2	42.7
U. S. 13	11	3600	0.1	62.4	14.5	11.6	11.4	44.3
" 44	3	500	0	40.8	22.4	31.8	5	50.2
" 88	1	200	0	31.5	51	15	2.5	47.7
" 98	1	300	0	48	5.7	6	40.3	57.7
" 442	1	200	0	22	63	13	2	49.0
DeKalb 639	1	200	0	0	0	14	86	87.2
" 680	1	200	0	0	11.5	36.5	52	78.1
" 800 A	1	200	0	0	9.5	38.5	52	78.5
" 816	2	300	0	39	51	9	3	44.4
" 817 A	1	200	0	0.5	8.5	69.5	21.5	72.4
" 825	1	200	0	4.5	30.5	39	26	67.3
" 827	3	600	0	71.2	20.8	5.7	2.3	37.8
" 835	1	200	0	1	18.5	48	32.5	72.4
" 840	2	400	0	30	28.3	25	16.7	55.7
" 899	1	200	0	75	25	0	0	35.0
Ky. Y 102	5	900	2.2	76.3	12.1	8.6	0.8	35.9
Indiana 608	2	600	0	31	28.3	29.5	11.2	54.2
Ohio C 88	5	1000	0	73.4	6.7	5.8	14.1	42.1
Iowa 939	8	1300	0.1	62.7	16.8	8.5	11.9	43.9
Iowealth TX-1	1	200	4.5	93	2.5	0	0	29.6
" AQ	1	200	0	15.5	67	16	1.5	50.7
" 25	2	400	0	84	14	2	0	33.6
Aver. of 22 Misc.Hyb.[a]	1	2200	0	99.3	27	0	0	30.1
Aver. All Hybrids		24500	0.2	58.8	16.8	14.3	9.9	45.0

[a] Hybrids grown in Somerset County affected by nutritional condition.

Table 4. Degree of Injury on Open-Pollinated Field Corn in Maryland

Variety	Acres	Plants Examined	Number of Plants Affected				
			None	Slight	Moderate	Severe	Dead
			0-20	21-40	41-60	61-80	81-100 *
Reid Yel. Dent	70 1/4	2200	5	1629	445	109	13
Golden Queen	1 1/2	1000	0	784	69	71	76
Lancas.S. Crop	55 1/4	700	8	548	87	36	21
Johnson Co. White	15	400	0	367	33	0	0
Sholls Big Dent	1/4	200	0	195	5	0	0
Pomonkey Ensilage	1/4	200	11	187	1	1	0
Prosperity	2	100	13	68	13	5	1
Total Pollinated	144 1/2	4800	37	3778	653	222	111

* Range of leaf blight area in per cent

Table 5. Percentage of Leaf Blight on Open-Pollinated Field Corn in Maryland

Variety	Farms	Plants Examined	Degree of Leaf Blight Injury					Average Leaf Area Blighted
			None	Slight	Moderate	Severe	Dead	
Reid Yel.Dent	10	2200	0.2	74	20.2	5.0	0.6	36.4
Golden Queen	6	1000	0	78.4	6.9	7.1	7.6	38.8
Lancas.S.Crop	4	700	1.1	78.4	12.4	5.1	3	36.1
Johnson Co. White	2	400	0	91.7	8.2	0	0	31.7
Sholls Big Dent	1	200	0	97.5	2.5	0	0	30.5
Pomonkey Ensilage	1	200	5.5	93.5	0.5	0.5	0	29.2
Prosperity	1	100	13	68	13	5	1	32.6
Aver. Open-Pollinated		4800	0.8	78.7	13.6	4.6	2.3	35.8

Table 6. Summary of Yield and Disease Damage on Hybrid and Open-Pollinated Field Corn at Five Experiment Station Test Plots [a] in Maryland

Name and Maturity group	Yield of grain (Marketable)		Marketable ears	Mouldy ears	[b] Leaf Blight	Broken Stalks
	Per Acre	Relative	(By number)	(By number)	Area	(Breathedsville)
	Bu.	Per ct.	Per ct.	Per ct.	Per ct.	Per ct.
EARLY						
Ohio W54	57.6	88	90	3.7	44	15
Indiana 610	60.0	92	89	2.5	44	22
Ohio W17	59.1	90	89	1.7	41	21
Iowa 939	64.6	99	93	2.2	39	12
Pioneer 314	61.6	94	81	3.4	36	13
Lancaster S.Crop	55.0	84	85	6.6	39	19
MEDIUM EARLY						
U. S. 44	58.2	89	85	3.6	52	19
Pioneer 300	62.0	95	89	4.6	50	21
Pioneer 332	68.3	104	92	2.7	47	25
Funk G 94	68.3	104	91	2.3	39	7
U. S. 13	71.5	109	92	2.2	38	14
Funk 6298	64.8	99	89	3.3	38	15
Ohio C 88	60.6	92	90	3.8	35	21
Golden Queen	67.9	104	86	6.4	25	23
MEDIUM LATE						
National 125E	65.5	100	82	4.4	32	23
Iowealth 29A	67.8	104	85	2.9	31	17
Illinois 200	70.9	108	86	3.2	26	19
Illinois 784	72.3	110	88	1.4	24	26
Funk G 583W	75.3	115	92	1.2	18	23
Kentucky 72	71.9	110	85	1.7	18	12
LATE						
U. S. 262	76.6	117	94	0.6	30	10
U. S. 357	76.1	116	92	1.0	23	3
Illinois 448	74.4	114	88	1.8	23	15
Funk G 136	73.1	112	86	1.5	23	14
U. S. 99	78.1	119	90	1.1	20	5
Reid Yel.Dent	61.4	94	84	4.7	28	14
Johnson Co.White	64.7	99	84	5.5	21	8
Aver. of Hybrids	67.8	103.5	88.6	2.5	33.5	16.2
Aver. of Open-Poll.	62.3	95.3	84.8	5.8	28.3	16.0

[a] Data supplied by R. G. Rothgeb and A. D. Hoadley, Agronomy Department, in Misc. Publ. 12:18, Dec. 1942. Test plots located at College Park, Spencerville, Ridgely, Hampstead, and Breathedsville, Maryland.

[b] Average for plants at four locations, Ridgely excluded.

SUMMARY. From the field corn leaf blight survey conducted in Maryland during 1942, no hybrid or open-pollinated variety was found immune from leaf blight, although some were affected much less than others. In general, early planted corn, and short season corn, whether hybrid or open-pollinated, showed more leaf blight infection than late planted or long season corn.

Open-pollinated varieties were less damaged than most hybrids. The average leaf blight injury on hybrids ranged from 87.2% for the most severe to 20.0% for the least injured with a mean average of 45.0%. For the open-pollinated varieties it ranged from 38.8% to 29.2%, with a mean average of 35.8%. The average leaf blight infection for all corn was 43.5%.

Where 4 or more farms are represented in the survey, Funk G 135 and Kentucky Y 102 had less leaf blight injury than any other hybrids, while Pioneer 332 and 300 showed more injury. In the open-pollinated varieties Lancaster Sure Crop had the least, and Golden Queen the most leaf injury. The greatest frequency of leaf blight for hybrid corn was in the range of 40-50%, and for all corn it was in the range of 30-40%.

Ear rots following leaf blight injury were more prevalent than usual and open-pollinated varieties showed more moldy ears than the most susceptible hybrid corn. Stalk rots and ear rots caused by Diplodia were about 8 times more prevalent than those caused by Gibberella.

The information obtained from this survey is based on the severe 1942 season only, and the conclusions drawn should not be a basis of recommendations for the 1943 crop. Leaf blight records for another year may be different depending upon the season, soil, time of planting and the presence on the leaves of both the bacterial and Helminthosporium leaf blights together, or separately.

(COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS, EXTENSION SERVICE, UNIVERSITY OF MARYLAND AND THE U. S. DEPARTMENT OF AGRICULTURE, COOPERATING).

SOYBEAN DISEASES IN MINNESOTA

Ian W. Tervet

Varietal trials: The relative prevalence of disease on duplicated rows of 50 varieties and strains of edible and field soybeans was observed in the field at University Farm, St. Paul, Minnesota during 1942. Weather conditions during the growing season were decidedly unfavorable for the crop; cool wet weather followed seeding (May 25) while the severe freeze of late September injured very severely all but the earliest varieties.

The most conspicuous disease in the early part of the season was bacterial blight (Phytomonas glycinea (Coerper) Burkholder) [Pseudomonas], many plants having severely injured leaves by the first week in July. However, by the middle of July, no symptoms were evident on the youngest leaves, the advent of warmer, drier weather apparently stopping the spread of the disease. Bacterial blight again was very evident by the beginning of September, the pods being heavily attacked.

A canker of the basal part of the stem stunted and killed many young plants. Fusarium and Rhizoctonia were most frequently isolated from the

cankers. In one series of plots, where seed treatment experiments were being made, many plants were killed by the girdling of the stems by cankers. The disease apparently started in one row of untreated seeds and spread over several adjacent rows of treated and untreated seed.

Soybean mosaic was very conspicuous in the plots and by early August had severely damaged most infected varieties. However, many varieties did not show evidence of mosaic, while in 3 varieties, Mukden, McClave, and Etum, plants with characteristic leaf symptoms of mosaic were not stunted and apparently were not injured. In several varieties, a leaf mottling was evident. It appears unlikely that this second symptom is a manifestation of soybean mosaic and it may be that a second virus was present. Although infected plants commonly were somewhat less vigorous than healthy plants, stunting was less pronounced than in the case of mosaic. It was not possible to obtain the reaction of all varieties to mottle-leaf because of the prevalence of mosaic.

The reaction of soybean varieties to bacterial blight, mosaic, and mottle-leaf for the 1942 season and their relative maturity on September 20, a few days preceding the first killing frost, are given in Tables 1 and 2.

Table 1: Reaction of varieties and selections of soybeans from seed supplied by the U. S. Department of Agriculture to mosaic, mottle-leaf, and bacterial blight, and maturity on Sept. 20, at St. Paul, Minnesota 1942.

Soybean variety	Prevalence of disease			Degree of ripeness Sept. 20
	Mosaic	Mottle-leaf	Bacterial blight	
Agate	O	S	M	R
Bansei	S	-	S	I
Cayuga	O	O	M	MR
Chusei	L	L	L	I
Etum	S	-	S	I
Giant Green	S	-	S	MR-R
Hakote	O	L	S	I
Hidatsa	L	L	S	R
Hokkaido	S	-	S	MR
Illini	O	O	M	MR
Jogun	O	L	L	I
Kanro	S	-	S	I
Kanum	S	-	L	I-MR
McClave	M	-	M	VI-I
Manchu Wis. No. 3	O	L	M	I-MR
Manchu Wis. No. 606	O	L	M	I-MR
Mandarin No. 507	O	L	L	MR
Mandell	O	L	S	I-MR
Mukden	L	L	M	I-MR
Ontario	O	L	L	MR
Sae	S	-	S	MR
Sousei-2W	L	O	M	I

O - no plants infected
L - up to 10% plants infected
M - 10-50% infected
S - over 50% infected
- no data obtained

VI - seeds very small, pods flat
I - seeds well-developed but very soft
MR - seeds somewhat harder than I
R - seeds hard and beyond frost injury

Table 2: Reaction of varieties and selections of soybeans from Minnesota-grown seed to mosaic, mottle-leaf, and bacterial blight, and maturity on Sept. 20, at St. Paul, Minnesota 1942

Soybean variety	Minn. Acc. No.	Prevalence of disease: Mosaic	Mottle-leaf	Bacterial blight	Degree of ripeness Sept. 20
F.P.I. No. 79610 *	-	O	O	L	VI
F.P.I. No. 92470	-	O	L	L	MR
Cayuga	205	O	L	M	MR
Habaro	109	O	O	M	I
Kabott	209	S	-	L	MR-R
Minsoy	139	O	M	M	R
Pagoda	208	S	-	S	R
Richland	206	L	M	M	I
Wisconsin Black	164	O	L	M	I-MR
Wis. Manchu No. 3	210	O	M	M	I
" " " " Minn.Sel.No.118	-	O	O	M	I
" " " " " No.120	-	O	O	M	MR
" " " " " No.123	-	O	O	M	I
" " " " " No.127	-	O	M	M	MR
Minn. Manchu	202	O	M	M	I
" " Minn.Sel.No.103	-	O	M	M	I
" " " " No.106	-	O	L	M	I
" " " " No.107	-	O	O	M	I
" " " " No.108	-	L	O	M	I
Hudson Manchu	211	L	O	S	I-MR
Mukden	204	O	M	M	I
" Minn.Sel.No.110	-	O	M	L	I
" " " No.111	-	L	O	M	I
" " " No.112	-	O	M	M	I
" " " No.113	-	L	O	S	I
Ontario Mandarin No. 3414	212	O	M	L	MR
Wisconsin Mandarin	207	L	O	M	MR-R
Holland No. 11	213	O	O	M	I
" No. 588	214	O	M	M	MR

O - no plants infected
L - up to 10% infected plants
M - 10-50% infected plants
S - over 50% infected
- - no data obtained

VI - seeds very small, pods flat
I - seeds well developed but very soft
MR - seeds somewhat harder than I
R - seeds hard and beyond frost injury

* F.P.I. refers to accession number of a foreign plant introduction made by the Bureau of Plant Industry, U. S. Department of Agriculture

Seed Treatment: Little information on the value of seed treatment in improving stands of soybeans is available. A limited test with 2 commercial fungicides, New Improved Semesan Jr. and Spergon, applied at 2 oz. per bu., on 67 farmers' samples of soybeans was made in the field at University Farm, St. Paul, in the spring of 1942. In only 5 cases was the stand measurably increased. The seed lots that responded to the treatment in each case had a low germination and even with seed treatment, satisfactory stands were not obtained. There was no clear evidence that seed treatment controlled any of the seed-borne diseases. (MINNESOTA AGRICULTURAL EXPERIMENT STATION).

ACREAGES OF PEANUTS, AND DISEASE LOSSES IN 1942

Peanuts are generally grown for two purposes; namely (1) food, and (2) oil. Commonly the large Bunch and Jumbo Runner Varieties are grown for food and the Spanish and Small Runner Varieties for both oil and food.

In general, there are three major diseases or disease complexes recognized on all varieties of peanuts; namely, (1) Cercospora leafspots, (2) seed decay at planting time, and (3) fruit, stem, peg, and root decays caused by a variety of organisms. Estimated peanut acreages, and disease losses in 1942 are given in Table 1. The data presented in the table are based on reports received from the states listed.

Table 1. Estimated Peanut Acreages and losses from Diseases in 1942.

State *	Acreages of Peanuts			Estimated Losses from		
	Bunch	Spanish	Runner	Cercospora Leafspot	Seed Decay	Rots
Arkansas	0	72,000	0	10	?	?
Florida	344,000, unclassified			?	?	?
Georgia	1,250,000, unclassified			25	10	10
Louisiana	52,000, unclassified			?	Stands Very Poor	?
North Carolina	200,000	90,000	30,000	20	10	12
Oklahoma	0	330,000	0	5	5	6
South Carolina	20,000	50,000	0	1	?	15
Texas	260,000	800,000	0	11	Stands Poor	2
Virginia	4,000	10,000	156,000	25	3	5

* Reports were not received from Alabama, Mississippi, or Tennessee.

Reference to Table 1 will reveal a rather disappointing group of material. This, incidentally, can be interpreted as a reflection of the limited experimental attention that has been given to diseases of this crop in the area of its commercial production. This lack of experimental attention to the diseases of peanuts is rather surprising since peanuts rank third as a cash field crop in the South being exceeded by cotton and tobacco. It is hoped that the current increased demands for peanut products will stimulate new interests in research on peanut diseases. The following goals in peanut production desired in the War effort for 1943, presents acreage figures challengingly different from those given in Table 1.

State	Requested 1943 Acreage of All Varieties
Alabama	850,000
Arkansas	130,000
Florida	250,000
Georgia	1,450,000
Louisiana	75,000
Mississippi	130,000
Oklahoma	515,000
South Carolina	125,000
Texas	1,300,000
Virginia	220,000
North Carolina	405,000
Tennessee	250,000
New Mexico and California	25,000
Total	5,500,000

(From Recommendations for the Control of Peanut Diseases, Communication from the War Service Committee, Southern States Plant Pathologists. Compiled by Luther Shaw, Chairman. The report goes on to discuss methods and materials for the control of diseases).

CORN SEED TREATMENT EXPERIMENTS IN 1942

Arnold J. Ullstrup

In 1942 2 experiments were conducted on fungicidal treatment of seed corn. In one experiment, No. 1, 3 grades of seed were used and a portion of each sample was treated with Spergon at the rate prescribed by the manufacturer, and the other half was left untreated. Two kernels were planted per hill in 4 x 5-hill plots in 6 replications. The field design was a 6 x 6 Latin square.

The second experiment, No. 2, was an attempt to determine the comparative values of different fungicides in controlling seedling blight. Five compounds were employed on one grade only, namely, the natural seed. The rate of planting and field design were the same as for the first experiment.

Table 1. Corn Seed Treatment Experiments 1942

Treatment	Mean stand count per plot: Early stand count	Mean stand count per plot: Final stand count	Mean yield per plot
	Plants	Plants	Bushels per acre
Experiment No. 1			
Sound Seed			
Spergon	39.0	39.0	63.2
Untreated	38.3	38.7	60.4
Natural seed [a]			
Spergon	32.5	32.7	53.3
Untreated	27.5	30.2	51.3
Damaged seed [b]			
Spergon	31.2	33.3	56.8
Untreated	20.3	28.7	50.2
Minimum difference required for significance at 1% level	3.4	3.8	7.8
Experiment No. 2 [c]			
Spergon	34.7	34.8	48.7
Arasan	35.2	35.7	50.9
Semesan, Jr.	33.8	34.5	52.0
Barbak C	32.7	33.8	51.6
Red Copper Oxide	32.2	34.5	52.9
Control	30.5	32.2	48.6
Minimum difference required for significance at 1% level	4.3	4.3	10.7

[a] Seed before damaged kernels were removed (20% damage).
[b] 100% mechanical damage (earworm injury and mechanical abrasions).
[c] In experiment No. 2, natural seed was used (see footnote [a]).

Plantings were made on April 30. The following 10 days were unseasonably cold and wet, thus providing optimum conditions for the development of seedling blight. The first stand counts were made 14 days after planting and the final counts after silking. Plots were harvested on October 27.

The results presented in Table 1 for Experiment No. 1, show highly significant differences between early stands of treated and untreated lots

of the "natural" seed grade, and between treated and untreated lots of the damaged seed grade. This relationship does not hold for the sound, healthy seed grade. In final stand counts, only the damaged seed grade shows a significant increase in treated over untreated lots. No significant differences in yield were found for treatments within seed grades, but real differences between grades are striking.

In Experiment No. 2 significant differences between treatments and the control were evident only in early stand counts. In the final stands and in yield no significant differences were observed.

These experiments re-emphasize the value of sound, healthy seed and indicate essential equality in fungicidal properties of the mercurials and the nonmercury compounds tested.

(Cooperative investigations between the Division of Cereal Crops and Diseases, Bureau of Plant Industry, Agricultural Research Administration, U. S. Department of Agriculture, and the Purdue University Agricultural Experiment Station).

CHEMICAL SEED TREATMENTS FOR CORN

Donald H. Bowman

Because of the threatened scarcity of mercurial compounds due to the importance of mercury in war activities, an experiment was conducted in 1942 to evaluate the fungicidal properties of several nonmercurial compounds for treating seed corn. The experiment also was designed to gain information relative to the value of treating lots of seed corn which are occasionally damaged more or less extensively by the corn earworm.

Two hybrids, Ohio C28 and Iowa 931, were used in this experiment. Ohio hybrid C28 was divided into 2 lots, one consisting of sound seed and the other of seed in which the endosperm of every kernel had been damaged as a result of earworm feeding. The seed was planted on May 26, following a period of rainy weather while the soil was still wet. Planting was made in 4 replications of 2 x 10-hill plots following a randomized, modified Latin square design with 2 restrictions.

The results of the experiment will be discussed for the most part in terms of averages. The data were analyzed statistically, but the large error obscured certain seemingly apparent differences. During a local midseason drought, the lack of soil uniformity with respect to soil moisture was quite apparent and consequently introduced considerable error into the experiment. In addition, a moderately heavy aphid infestation contributed considerably to the variability in the experiment.

The data are given in Table 1. The yield of hybrid C28 from damaged seed was improved equally by all treatments, as compared with the untreated seed. The 7 treated plots yielded an average of 84.1 bu. per acre, as compared to a yield of 73.9 bu. per acre from the untreated plots. None of the treatments were found to improve materially the yield of either hybrid from sound seed.

The height of the plants from the damaged seed at 4 weeks after planting was increased slightly by all treatments, whereas, there was little

Table 1. A comparison of the relative value of mercurial and nonmercurial fungicidal dusts for treating seed corn, Wooster, Ohio, 1942

Variable measured	Hybrid	Treatment: New Improved Semesan Jr. 1 1/2 oz. per bu.	Barbak 1D 1 1/2 oz. per bu.	Merko 2 oz. per bu.	Spergon 1 1/2 oz. per bu.	Arasan 2 oz. per bu.	Fermate 2 oz. per bu.	Brown cupric oxide naphthenated	Untreated	Average of treated plots	Average of all plots
Acre yield, bu.	Oh. C28 [a]	77.6	78.1	85.9	77.4	83.7	74.5	72.1	79.5	78.5	78.6
	Oh. C28 [b]	80.6	82.0	85.0	82.7	84.2	89.3	84.6	73.9	84.1	82.8
	Ia. 931 [c]	64.7	70.0	65.3	65.9	77.0	78.4	75.5	77.2	71.0	71.8
	Average	74.3	76.7	78.7	75.3	81.6	80.7	77.4	76.9		
Plant height at 4 weeks, cm.	Oh. C28	83.6	82.2	83.0	83.9	81.7	82.4	83.4	84.6	82.9	85.6
	Oh. C28	69.9	71.3	69.9	72.0	73.4	73.3	70.4	66.0	71.5	70.8
	Ia. 931	85.7	81.4	85.1	81.1	86.0	82.9	81.2	79.7	83.5	82.9
	Average	79.7	78.3	79.3	79.0	80.4	79.5	78.3	76.8		
Total stand at 3 wks., %	Oh. C28	98.1	98.4	96.9	97.5	97.8	95.6	97.8	97.8	97.4	97.5
	Oh. C28	94.7	93.4	94.1	92.8	95.6	95.9	95.0	93.4	94.5	94.4
	Ia. 931	96.9	95.6	95.9	98.1	98.4	96.5	95.6	94.1	96.7	96.4
	Average	96.6	95.8	95.6	96.1	97.3	96.0	96.1	95.1		
Total stand at harvest, %	Oh. C28	96.6	94.4	93.8	94.1	95.6	92.5	91.9	95.6	94.1	94.3
	Oh. C28	88.1	85.9	84.2	87.8	88.1	89.4	89.1	79.4	87.5	86.5
	Ia. 931	91.9	95.3	92.5	92.2	97.2	92.1	94.4	92.2	93.7	93.5
	Average	92.2	91.9	90.2	91.4	93.6	91.3	91.8	89.1		

[a] Lot no. 1, sound, large flats.
[b] Lot no. 2, earworm damaged, mixed grades.
[c] Sound, large flats, carried over 1 year.

Table 1 cont.

Differences required for significance:
Yield between hybrids ..... 5.1 bu.
Height between hybrids ..... 2.1 cm.
Stand at harvest between hybrids ..... 1.9 %
Stand, hybrid-treatment interaction .... 7.3 %

---

or no difference in plant height between the treated and untreated plots from sound seed.

Emergence from the damaged and sound seed was not benefited by any of the treatments. However, the percentage of emergence from the damaged seed was slightly less in all plots, both treated and untreated, than from the sound seed. The percentage stand at harvest was lower than the percentage emergence in all plots. This was especially true with regard to plots planted with damaged seed. The percentage stand at harvest from sound seed was not improved by the seed treatment of either hybrid. On the other hand, all treatments equally improved the percentage stand on the plots planted with damaged seed. The stand of the 7 treatments averaged 87.5%, while that from the untreated plots averaged 79.4%. The loss of plants during the season from all of the treated damaged seed plots averaged 7%, whereas, the loss of plants in the untreated damaged seed plots averaged 14%.

Under the conditions prevailing in this experiment, the nonmercurial fungicidal dusts were found to be about equally as effective as the commonly used mercurial dusts and no doubt, could be substituted for them. However, the relative value of the different dusts under cold soil conditions cannot be foretold from this experiment. In the case of seed lots containing appreciable damage as a result of earworm feeding, the application of any of the treatments was found to be beneficial, both from the standpoint of total stand and yield.

(Cooperative investigations between the Division of Cereal Crops and Diseases, Bureau of Plant Industry, Agricultural Research Administration, U. S. Department of Agriculture, and the Ohio Agricultural Experiment Station).

CROTALARIA SPECTABILIS IMMUNE TO ROOT KNOT NEMATODE

The root knot nematode is one of the limiting factors in crop production in the South and one of the most difficult to control. The most practical control method is crop rotation, using crops that are highly resistant or immune to the disease, so as to starve the nematodes in the soil. Unfortunately, very few immune crops are known. Extensive tests have proved Crotalaria spectabilis to be one of them. Current investigations show that its roots are entered by the larval root knot nematode but that very few of these invaders make any developmental growth, that only occasional specimens grow to the adult stage, and that none has yet been found to produce eggs and progeny. (G. Steiner, Division of Nematology, in Salter, R. M. Report of the Chief of the Bureau of Plant Industry, 1942, pp. 18-19.).

POTATO, TOBACCO, AND ONION DISEASES IN MASSACHUSETTS IN 1942

C. C. Boyd

Potatoes. Last year, Massachusetts grew 19,000 acres of potatoes with an estimated total production of 2,850,000 bu. This year, the state goal is an acreage of 110% of last year's, or 20,900 acres. Even though the yields last year of potatoes and most vegetables were higher than normal, due to favorable growing conditions, the average yield for all potatoes in the state was only 150 bu. per acre. This is astoundingly low when we realize that the better growers of commercial acreages obtain year after year yields of 300 to 400 bu. per acre.

In order to make the best of the effort toward meeting the state's goal, good yields are going to be necessary. High yields are out of the question unless good seed and proper cultural and pest control practices are employed. R. W. Donaldson has estimated recently that only slightly more than half the 1942 acreage of potatoes was planted with certified seed, slightly more than one-fourth with imported "selected" seed, and the remainder with home-grown potatoes. It is primarily the small-acreage growers and the home gardeners who keep down the state's average yield. It is futile to plant good, disease-free seed if the crop is not properly fertilized or protected from insects and diseases. It is equally difficult to obtain good yields if poor seed is planted regardless of how well the crop is fertilized, cultivated and protected from pests. Too many home gardeners combine all of these unfavorable factors -- poor seed, improper fertilization, and inadequate pest control -- and as a result obtain very low yields of potatoes.

Recommendations for 1943: Buy certified seed potatoes. This is advisable for the home gardener and the small-acreage grower (1 to 5 acres) as well as the larger commercial growers. The blue tag of certification guarantees a minimum content of harmful diseases as well as a minimum varietal mixtures and cut, bruised or otherwise injured tubers. "Selected" seed usually represents seed stocks that failed to make the certification grade because of excessive disease content. Home-grown seed potatoes, even though from a crop grown last year from certified seed, are likely to carry a high percentage of leafroll-infected tubers as well as various other diseases that increase extensively in one season in our gardens and fields.

The commercial grower certainly cannot afford to plant low-yielding seed potatoes. And, the home gardener, if he cannot obtain certified seed, might better plant the space to important vegetables and then buy his eating potatoes. Disappointment is certain for the home gardener who plants poor seed potatoes.

Control Insects and Diseases: If you are planning to plant potatoes, then you must likewise plan to fight the potato bug, the flea beetle, the leafhopper, plant lice or aphids, as well as early blight and late blight. The late blight is capable of rotting the tubers either before or after harvest, in addition to injuring the leaves and branches. Controlling these pests requires one application after another of the right kind of dust or spray throughout the growing season.

Potato Disease Situation Last Year: Late blight [Phytophthora infestans] appeared early (June 26 in Connecticut Valley) and was considerably more widespread and severe than in the average season. Some unsprayed fields in Bristol County and unsprayed gardens in all parts of the State suffered moderate to total loss from premature death of the tops. It is estimated that at least 95% of all plantings had blight to some extent on the tops, although in general, the amount of tuber decay in protected plantings was far less than was expected. Most of the losses in the form of tuber decay occurred in untreated gardens and fields.

Early blight [Alternaria solani] was somewhat more prevalent generally, particularly on Irish Cobblers and Chippewas, but it caused only slight defoliation even in the worst cases. Bacterial canker [Corynebacterium sepedonicum], (only one case observed) and leafroll [virus] were noticeably less damaging than in 1941, while Rhizoctonia stem-rot [R. solani] and spindle tuber [virus] were more damaging than in the average season. Scab [Actinomyces scabies] and mosaic [virus] were about normal, while black leg [Erwinia phytophthora] was unusually damaging in Sebago and Cobblers. Pink rot [Phytophthora erythroseptica], on the farm in the Hampshire hills where it has caused serious losses in past years, was almost totally absent at digging time this year, even in fields continuously cropped to potatoes.

Tobacco Disease Losses in 1942: Downy mildew [Peronospora tabacina]. Primary bed infections were earlier and more numerous in the state last year than in any past season. It was first observed in lower Hampden County on May 5 to 7 when the plants were still thin and small, and in Hampshire and Franklin Counties around May 15 to 20. The almost continuously cool, damp weather from May 4 to 23 favored its development and secondary spread within and between beds. However, the majority of the secondary bed infections did not appear until June during field setting and resetting. By the last week of June and first week of July, it was present as traces to moderate infections on the lower leaves in a majority of open and shaded fields. In some cases, leaf spots occurred on the lower one-third to two-thirds of the leaves -- higher up the stalk and in a larger number of fields than in most past seasons. Until July 20-25, the fungus was still active on some of the leaf spots in occasional Havana seed and shaded fields, the latest it has ever been observed to remain active in the field in this state. Control efforts were successful with either benzol or PDB only where the beds were made strictly tight during the fumigation. Majority of growers who treated used the PDB crystals treatment. The disease, as in past years, was more damaging in cloth-covered beds of Hampden County than in sash beds.

Heretofore, gassing the tobacco beds with benzol or with paradichlorobenzene has been the principal treatment for blue mold or downy mildew. Last year, Dr. P. J. Anderson at the Windsor, Connecticut Station obtained equally good control with repeated applications of a spray of Fermate or iron carbamate (ferric-dimethyl-dithio-carbamate). For beds that can not be made gas-tight, this method of control may prove to be more practicable than the gassing treatment. It will be given a thorough trial in the test beds at the College this year, and plans are under way to supervise its use in a few beds on the farms.

Damping-off and bed rot [various organisms] were somewhat more damaging generally than usual, although they were totally absent in many beds. They were readily prevented or checked by regular applications of either Bordeaux sprays or dusts.

Wildfire [Pseudomonas tabaci] was practically absent in beds and fields, while angular leaf-spot [P. angulata] was observed in a number of beds, but only one appreciable infection in the field was encountered, in Conway, Franklin County.

Black root-rot [Thielaviopsis basicola] and brown root-rot [undet.] both were more prevalent and damaging than in most past seasons. All instances of the latter disease occurred in fields following grass, corn, potatoes or following tobacco one year removed from a sod crop. Black root-rot, as usual, was associated with soils too high in pH.

Mosaic [virus] and Rhizoctonia sore-shin [R. solani] were more widespread and damaging than in most past seasons, although both were negligible in many fields. Sore-shin contributed to a great deal of lodging following wind storms.

Onion Disease Losses Last Year: Smut [Urocystis cepulae] and damping-off were more damaging to seed onions than usual, at least in some fields. Smut was most noticeable on old onion land. The most pronounced troubles in set-onion fields were root rots (mostly by Fusarium spp.), Fusarium bulb rot, and bacterial soft rot of bulbs following broken leaves and following the removal of seed-stalks. Blast [non-par.] was moderate to severe in many seed, seed-set and set fields, but it caused only slight damage to similar plantings on other farms. Downy mildew [Peronospora destructor] was neither observed nor reported in spite of a wet season that favored the development of downy mildews of tobacco and potatoes. (MASSACHUSETTS STATE COLLEGE).

HOSTS OF VIRUSES ON VEGETABLE SEEDLINGS

List compiled by
Department of Plant Pathology, Cornell University

Florists are growing many vegetable seedlings to meet the great demand from Victory Garden owners. These florists have well in hand the technique of growing and should produce excellent plants. Their one possible pitfall is the presence of one or more of the 3 virus diseases commonly found on vegetables, especially on tomato, eggplant, pepper, and muskmelon. Members of the cabbage family are not affected by any one of these 3 and can safely be grown near flowers.

A list of the virus hosts is appended. It does not include all of the plants affected, but an attempt was made to name those which might be troublesome in New York. Petunia and Jerusalem cherry are 2 of the most dangerous flowers when grown in proximity to vegetables.

If possible, the vegetable seedlings should be grown in a separate greenhouse or hot bed. Persons working with flowers should wash their hands with soap and water before touching the vegetables. Care should be taken not to have weeds within 50 yards of the greenhouse or plant bed. The weeds are most effectively destroyed by frequent mowing with a lawn mower or by growing cultivated crops about the plant bed.

Three Common Greenhouse Viruses and Their Hosts

Tobacco mosaic

Amaranthus
Apple of Peru
Aster dumosus
Bean
Bedstraw
Beet
Browallia speciosa
Buckwheat
Carpet weed
Carrot
Celandine
Chickweed
Chickweed (mouse-ear)
Cockle
Cranesbill
Cress (mouse-ear)
Cynoglossum
Dock
Eggplant
Emilia sp.
Figwort
Fleabane (daisy)
Foxglove (common)
Galinsoga
Gesneria sp.
Ground cherries
Hawkweed
Henbane (black)
Horehound (water)
Horsenettle
Horseweed
Jerusalem cherry
Jimson weed
Lamb's quarter
Larkspur (forking)
Linaria spp.
Lobelia
Marigold (cape)
Marigold (French)
Matrimony vine
Morning glory (Heavenly Blue)
Mullein
Mustard (white)
Mustard (hedge)
Nettle (dead)
Nightshade
Pennyroyal
Pentstemon
Peppers (ornamental pepper)
Pepperwort
Petunia
Phacelia spp.
Phlox
Plantain
Pokeweed (scoke)
Potato
Purslane
Ragweed
Ragweed (giant)
Self-heal
Shepherd's purse
Smartweed (spp.)
Snapdragon
Solanum spp.
Spanish needle
Speedwell
Spinach
Spinach (New Zealand)
Tobacco (spp.)
Tomato
Unicorn plant
Verbena (white)
Water cress (marsh)
Zinnia

Cucumber mosaic

Apple of Peru
Balsam apple
Balsam pear
Beet
Belladonna
Broad bean (faba)
Bryonopsis
Bryony
Buckwheat
Calendula
California bluebell
Carrot
Catnip
Celery
Chayote
Chenopodium
China aster
Clover (crimson)
Cockle
Cockscomb
Columbine
Commelina
Convolvulus sp.
Corn
Cowpea
Cranesbill
Crown-of-thorns
Cucumber
Cucumber (bur)
Cucumber (squirting)
Cucumber (wild)
Cucumis spp.
Cynoglossum
Dill
Eggplant
Emilia sp.
Fennel
Geranium
Gherkin (West India)
Gilia
Gourd
Gourd (dish cloth)
Gourd (snake)
Gourd (white)
Ground cherries
Heliotrope
Henbane (black)
Horsenettle
Hyacinth (common)
Jimson weed
Larkspur (forking)
Lily
Lobelia
Lupine

Cucumber mosaic cont.

Marigold (French)
Melothria scabra
Milkweed
Mints (various)
Morning glory (common)
Motherwort
Muskmelon
Nasturtium
Nightshade
Onion
Parsnip
Pentstemon
Peppers
Periwinkle
Petunia
Phlox
Pinkroot
Pokeweed (scoke)
Polyanthus sp.
Potato
Primula
Pumpkin
Ragweed
Rye
Scabiosa
Snapdragon
Sorghum
Soybean
Spinach
Spinach (New Zealand)
Squash
Sweet potato
Teosinte
Tobacco
Tomato
Tradescantia
Tulip
Turnip
Unicorn plant
Violet
Wandering Jew
Water cress
Watermelon
Wheat
Zinnia

Spotted wilt

Anemone
Amaryllis
Apple of Peru
Aster sp.
Bean
Begonia
Belladonna
Bittersweet
Broad bean (Vicia faba)
Browallia speciosa
Calceolaria
Calendula
Calla
Cauliflower
Campanula
Celery
Cheiranthus sp.
China aster
Chrysanthemum
Cineraria
Columbine (garden)
Coreopsis
Cosmos
Cowpea
Dahlia
Delphinium
Eggplant
Emilia sp.
Gaillardia
Gloxinia
Ground cherries
Henbane
Hippeastrum sp.
Iceland poppy
Jerusalem cherry
Jimson weed
Layia sp.
Lettuce
Lobelia
Lupine
Matrimony vine
Nasturtium
Nightshade
Pea
Pentstemon
Peony
Peppers
Petunia
Potato
Primula
Ranunculus sp.
Salpiglossis
Salvia
Scabiosa
Schizanthus sp.
Smartweed
Snapdragon
Solanum spp.
Streptosolon
Tomato
Zinnia

(CORNELL UNIVERSITY, ITHACA, NEW YORK).

SEED TREATMENTS FOR THE VICTORY GARDEN

George L. McNew

Poor stands of plants are one of the first disappointments an amateur vegetable gardener encounters. Perfectly sound seed may fail to produce

plants if the soil is cool and moist after planting. Either the seed are decayed or the young plants are damped-off by soil-inhabiting fungi. In order to avoid such losses, it is necessary to treat the seed with some protective chemical that will destroy the fungi. If the fungi are controlled, the soil moisture and low temperatures will not injure the seed. Some of the chemicals have been tested extensively and can be recommended for general use. Among the better seed treatments are the following:

Vegetable crop to be treated	Seed treatments recommended					
	First choice		Second choice		Third choice	
	Material	Rate*	Material	Rate	Material	Rate
		%		%		%
Lima beans	Spergon	0.21	Arasan	0.10	Fermate	0.21
Peas	Spergon	0.20	Semesan	0.25	Red Cuprocide	0.25
Spinach	Zinc oxide	2.00	Red Cuprocide	2.00	Spergon	1.50
Cabbage	Semesan	0.40	Zinc oxide	2.00	Calomel-on soil	--
Beets	Red Cuprocide	1.50	Semesan	2.50	Arasan	1.00
Sweet corn	Semesan Jr.	0.16	Arasan	0.11	--	--
Lettuce	Red Cuprocide	2.00	Semesan	1.00	Zinc oxide	2.00
Cucumbers**	Semesan	0.25	Red Cuprocide	0.25	Spergon	0.25

* See discussion under rate of application.

** Melon, squash, and pumpkin should receive the same treatments as cucumbers.

Choice of Materials. The treatments listed for first choice have given superior results in nationwide tests conducted by a committee appointed by the American Phytopathological Society to coordinate all research on vegetable seed treatments. The other materials are listed as second and third choices either because they have not shown up so consistently beneficial in the nationwide tests or because they are so new that they have not been tested extensively.

All of the materials listed are considered as being reliable seed protectants. Some of the second and third choices have actually been superior to the first choice under certain local conditions.

Rate of Application. Attention should be paid to the use of the proper dosage. In times like these, the chemicals should not be wasted by excessive dosage and neither should the seed be left unprotected and exposed to decay organisms in case of adverse weather. Some of the chemicals, such as red cuprocide, may be harmful if dosages are too excessive, but there is a considerable range of safe dosages even for this material.

The rates of application given in the table are the preferred ones. These are expressed as percentage by weight. For example, garden peas should be treated with Spergon at 0.20% by weight. This means that 100 pounds of seed require 0.2 (1/5) of a pound, or 3 ounces. One pound of seed, therefore, should receive 3/100 of an ounce of Spergon. This is less than a

quarter of a level teaspoonful.

Since the average home gardener will need less than an ounce of chemical for most crops, he would be wise to cooperate with his neighbors in purchasing the materials. If some gardeners leave 80% of the chemical unused, others are likely to do without because the supplies are not overabundant even though they are ample.

(FROM MIMEOGRAPHED LEAFLET ISSUED BY THE NEW YORK STATE EXPERIMENT STATION, GENEVA, NEW YORK).

NEW SEED PROTECTANTS

B. N. Davis

Two protectants, Thiosan and Tuads, containing tetra-methyl thiuram disulfide, and one protectant, Spergon, containing tetrachloro-para-benzoquinone, have been tested during the past year on 10 different vegetables. Three experiments were conducted on each of 10 vegetable seeds. All experiments included the protectant most generally used on the particular seed, the 3 new protectants, and untreated seed. All treatments were replicated 5 times with 100 seed in each replication. The following seeds were used: snap beans, lima beans, beets, corn, cucumber, lettuce, peas, peppers, radish, and spinach.

The results of these experiments are indicated below. The number of experiments (3 conducted) in which seed treatment gave increased seedling stands is indicated by the numeral following the name of the vegetable.

Beans - 2. All materials proved to be effective. Tuads proved to be as good as Semesan with Spergon and Thiosan only slightly less effective.

Lima Beans - 1. All new protectants were effective. Spergon and Tuads were slightly more effective than Thiosan.

Beets - 3. Red copper oxide was the best. Thiosan and Tuads also gave good control. Spergon did not give control.

Corn - C. Germination of the untreated seed was above 90% in all 3 experiments and equal to that of the treated seed.

Cucumbers - 3. All materials were effective.

Lettuce - 1. Red copper oxide and Semesan were the only materials that gave control.

Peas - 2. All treated seed gave better results than the control in one experiment. In the other experiment only Spergon gave increased germination.

Peppers - 1. Tuads, Thiosan, and Semesan increased germination. Spergon did not. Tuads proved better than both Semesan and Thiosan.

Radish - 3. All materials were effective. Thiosan, Semesan and Tuads were better than Spergon.

Spinach - 3. Semesan and red copper oxide proved to be the best materials but only slightly better than Thiosan and Tuads. Spergon did not give control.

Summary of Results with Thiosan and Tuads. In these tests both Thiosan and Tuads gave good protection of the 10 seed types used and gave no evidence of injury. They proved to be as effective as the organic mercury (Semesan) on all crops tested but were not so good as red copper oxide for beets and spinach. Red copper oxide has been used successfully and extensively on these crops for several years. It appears that these products may be used successfully on the same seed as the organic mercury.

Recently a material known as "Arasan" has been placed on the market containing the same active ingredient as Thiosan and differing only in physical properties that make it better adapted to seed dusting purposes.

Summary of Results with Spergon. The results with Spergon varied considerably depending on the kind of seed used, whereas the results with Thiosan and Tuads were more consistent. On beets the results with Spergon were no better than those from untreated seed and in 1 case out of 3 on spinach were the mean differences between Spergon-treated and untreated seed great enough to be significant. On beans, lima beans, and peas our results showed Spergon to be equal to or only slightly less effective than the other products. No injury was noted on these seed. The results from experiments conducted in other States has shown Spergon to be particularly effective on beans, lima beans, and peas.

(Excerpted from New Jersey Agricultural Experiment Station, Department of Plant Pathology, Plant Disease Notes, Vol. 20, No. 8, November 1942).

NEW DISINFECTANTS FOR SWEETPOTATOES

J. A. Pinckard and W. S. Anderson

The sweetpotato, Ipomoea batatas Poir., has been declared a war crop in several localities. Furthermore, according to a recent USDA War Board announcement, a production goal of 1,000,000 acres has been solicited. As a result of this expansion of acreage, the problem of obtaining a sufficient quantity of disease-free plants for the 1943 crop becomes of primary importance.

Although it is not difficult to produce sweetpotatoes, considerable loss may be sustained unless seed pieces are carefully selected, disinfected, planted in disease-free beds, and the resulting sprouts transplanted to disease-free land. Since sweetpotatoes are unusually susceptible to several very destructive diseases it is imperative that sanitation be practiced. In Mississippi the effective control of sweetpotato diseases has resulted in a large specialized plant growing business. According to records on file at the State Plant Board, several hundred certified seed producing farmers have grown disease-free sweetpotato plants for 5 consecutive years.

Mercuric chloride has played a major role in the successful production of sweetpotatoes for the past 29 years. As a seed piece disinfectant its use has been a standard practice since the date of its introduction by Harter and Field [1] in 1914. Unfortunately mercuric chloride is now both

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1 L. L. Harter and Ethel C. Field, Phytopathology 4: 279, 1914.

Table 1. Effect of root treatment upon numbers of seedlings and incidence of sweetpotato black-rot caused by Ceratostomella fimbriata

Treatments used	No. of trials	Total numbers of sprouts produced: Disease-free	Diseased	Percentage sprouts showing disease
Triumph Variety				
Sinox[1], 0.5%, 10 min.	1	253	0	0
Semesan Bel[2], 1.6%, 1 min.	1	373	0	0
Elgetol[1], 0.6%, 10 min.	1	175	4	2.3
DuBay[2], 1205FF, 1%, 10 min.	1	538	28	5.2
Hg Cl_2, 0.1%, 10 min.	1	239	15	6.3
Spergon paste[3], 1.6%, 10 min.	1	427	98	22.9
None	1	221	63	28.6
Porto Rico Variety				
Sinox, 2%, 1 min.	1	898	4	0.4
Elgetol, 2%, 1 min.	1	1054	20	1.9
Elgetol, 0.6%, 10 min.	1	1173	37	3.2
Sinox, 0.5%, 10 min.	1	1308	49	3.7
Hg Cl_2, 0.1%, 10 min.	1	1064	52	4.9
Semesan Bel, 1.6%, 1 min.	1	1133	62	5.5
Spergon paste, 1.6%, 1 min.	1	1421	528	37.2
None	1	1163	783	67.3

1 Supplied by Standard Agricultural Chemicals, Inc., Hoboken, N. J.
2 Supplied by Bayer-Semesan Co., Inc., Wilmington, Del.
3 Supplied by U. S. Rubber Co., New York City.

difficult to obtain and expensive; consequently substitute disinfectants have recently become important. Several chemical materials have been tested in our laboratory during the past year. Methods employed and results obtained are briefly described:

Seed lots consisting of uniform roots, usually 12, and uniform weight, approximately 3000 grams, were bagged and submerged in a freshly prepared spore suspension of Ceratostomella fimbriata (Ell. & Hals.) Elliott. After thorough wetting the bags were drained and allowed to remain damp over night. On the following morning the bagged roots were immersed in the assigned solution, drained, and bedded in sand. Electrically heated thermostatically controlled hot beds with board partitions separating each treatment and each replicate were used. A randomized block design using 4 replicates per treatment permitted statistical treatment of the data. When the plants reached a size suitable for field use they were pulled, counted, weighed, tied in bundles, and stored in a warm dark place for

6 days. At the close of this period the plants were examined under a hand lens for the presence of black rot. The results of several representative experiments are presented in Table 1. These results indicate that Sinox or Elgetol, both consisting basically of the sodium salt of di-nitro-ortho-cresol, may be of value in the control of black rot. Spergon paste, which is said to be 99% tetrachloro-para-benzo-quinone, with an added wetting agent, appears to possess little value under these conditions. The latter conclusion is in agreement with Cook and Harter[2] but in disagreement with Elmer[3].

It is hoped that di-nitro-ortho-cresol can be given further trials in the hands of other investigators this year.
(MISSISSIPPI AGRICULTURAL EXPERIMENT STATION).

FEBRUARY WEATHER AND THE WINTER OF 1942 - 1943

(From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the weeks ending March 2 and March 9, 1942).

The weather of February 1943, in nearly all sections of the country was characterized on the whole by above-normal warmth and widespread dryness. The monthly mean temperatures were slightly subnormal in a limited southeastern area and locally in the far Southwest, but elsewhere they were generally above normal, markedly so between the Mississippi River and Rocky Mountains. (Figure 1).

The month was outstanding for widespread deficiencies in precipitation as shown by Figure 2. The average for the entire United States was only 1.21 inches, or 57 percent of normal, making it the driest February of record. This means, for the country as a whole, an actual water shortage, based on the normal, of more than 200 billion tons. Previously, February 1895, with a country-wide average of 1.31 inches, held the record for dryness for this month. The fact that most of the principal agricultural States had an unfavorably dry spring, following the extreme dryness in February 1895, does not necessarily mean that the spring season this year will also be unfavorably dry. Climatological records show, in general, little or no relation between weather conditions in February and those for the succeeding spring months.

The relative driest States were Florida, with 25 percent of normal, Texas, 29 percent, and New Mexico, 32 percent.

February terminated the meteorological winter. Figure 3 shows that the temperature for the season averaged slightly below normal in the area from the Red River Valley of the North and the upper Mississippi Valley eastward to the Atlantic Ocean, and also in a limited far northwestern section; the deficiencies in temperatures were less than 2°, except locally. In all other sections of the country the winter was warmer than normal, although east of the Great Plains the plus anomalies were small, less than 2°, except locally. In considerable areas of the West the winter was 4°

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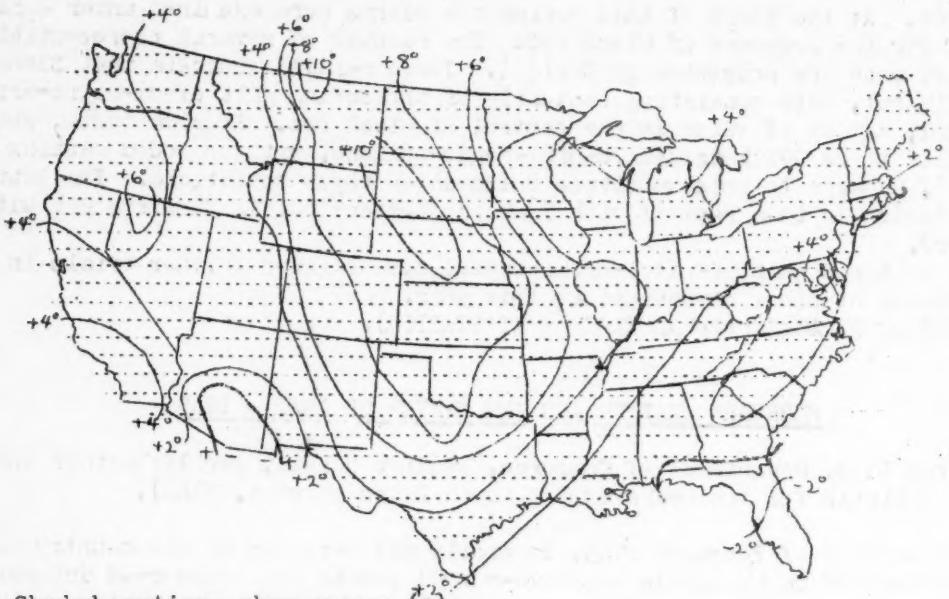
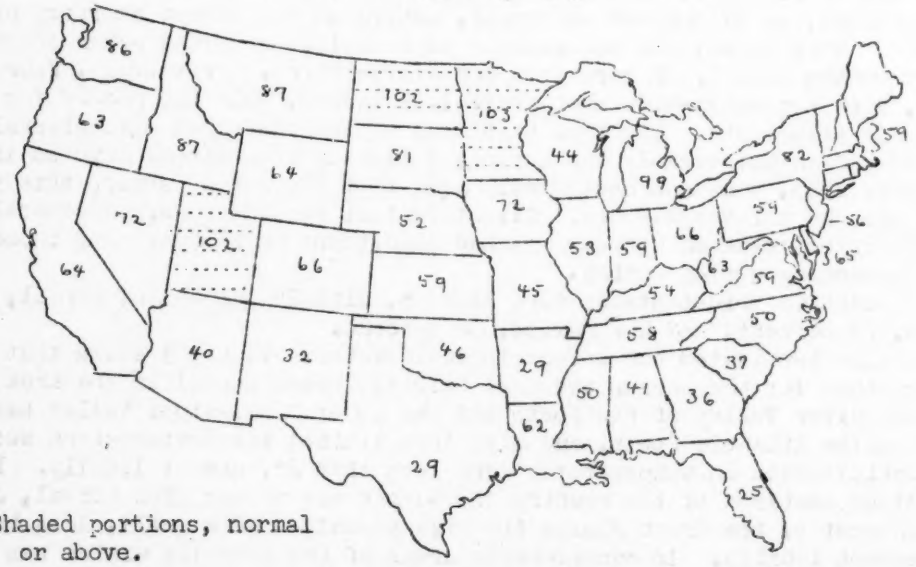
2 Harold T. Cook and L. L. Harter, Plant Disease Reporter 26: 222, 1942.
3 O. H. Elmer, Plant Disease Reporter 26: 44, 1942.



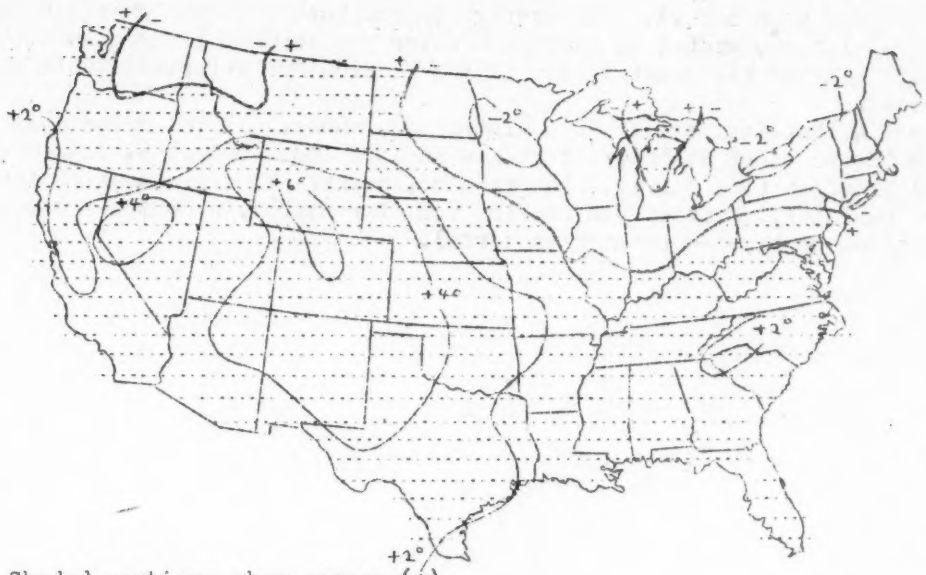
Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 1. -- Departure of Mean Temperature from Normal, February 1943



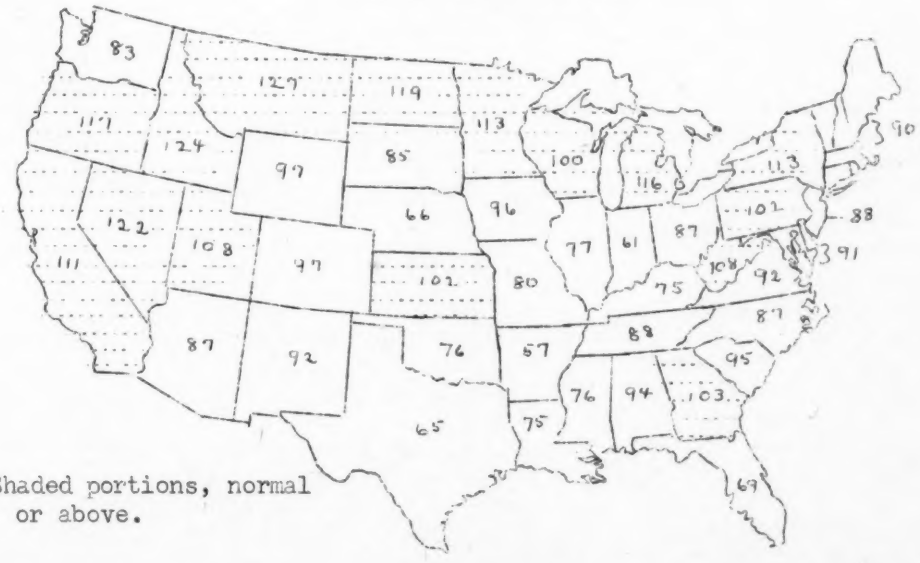
Shaded portions, normal or above.

Fig. 2. -- Percentage of Normal Precipitation by States, February 1943



Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 3. -- Departure of Mean Temperature from Normal for the Winter (Dec.-Feb.) 1942-43



Shaded portions, normal or above.

Fig. 4. -- Percentage of Normal Precipitation by States for the Winter of 1942-1943 (December - February)

to 6° warmer than normal. The average temperature was in rather marked contrast with the winter of last year which was abnormally warm in the northern half of the country east of the Rockies and relatively cold in the South.

Figure 4 contains data for the winter as a whole. It indicates that all northern border States, except New England and Washington, had above-normal precipitation for the winter; also, nearly all areas west of the Rocky Mountains. East of the Rockies very few States, except those of the extreme north, had as much as normal.